REMARKS

Claims 1-17 are pending in the application. Claims 7 and 13-17 are withdrawn from consideration as a result of a restriction requirement. Claims 2-5 are cancelled herein. Thus, claims 1, 6, and 8-12 are currently before the Examiner for further prosecution.

Claim Rejections under 35 U.S.C §103(a)

Claims 1, 2, 4-6, 9, 11, and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over JP 08-239636 (machine translation). Claims 3, 8, and 10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over JP 08-239636 (machine translation) (hereinafter JP '636) in view of U.S. Patent No. 5,110,388 to Komiyama et al. (hereinafter "Komiyama et al.").

Applicant respectfully requests reconsideration of the rejections based on the amendments and remarks set forth herein.

The pressure-sensitive adhesive layer used in the sheet of the present invention comprises a specific composition defined in amended claim 1. In the dicing and die bonding pressure-sensitive adhesive sheet of the claimed invention, the pressure-sensitive adhesive layer displays superior embedding properties with respect to irregularities on the die pads under die bonding conditions. Therefore, voids that often form between the die pads and the pressure-sensitive adhesive layer can be prevented, even when the chips are mounted on the die pads having a great difference in elevation. Product efficiency may thus be increased.

More specifically, the pressure-sensitive adhesive layer comprising the above claimed specific composition has a small ratio (M_{100}/M_{70}), that is, the layer has a modulus of elasticity at 100°C (M_{100}), which is remarkably lower than that at 70°C (M_{70}). This indicates that the pressure-sensitive adhesive layer becomes fluidized at high temperatures. Die bonding of semiconductor chips is generally performed at elevated temperatures, usually 100°C or above, and other work is performed at ordinary temperatures. Accordingly, the pressure-sensitive adhesive layer is fluidized under die bonding conditions and embeds into the irregularities on the die pads, thereby preventing voids. On the other hand, at low temperatures the pressure-sensitive adhesive layer maintains a certain level of modulus of elasticity and firmly adheres to the chips.

Therefore, good workability is ensured throughout the steps from dicing to picking up (see page 5, line 17 to page 6, line 1 and page 7, lines 3-17 of the instant specification).

As indicated in Table 2 of the specification, pressure-sensitive adhesive layers comprising the above specific composition and thereby having a ratio of (M_{100}/M_{70}) being 0.5 or less were superior in embedding properties at die bonding (as well as dicing properties, package reliability, and board mounting reliability).

In contrast, JP '636 and Komiyama et al. do not disclose or anticipate the above specific composition used for the pressure-sensitive adhesive layer of amended claim 1. The composition for forming a pressure-sensitive adhesive layer of JP '636 contains a flexible component (C). Therefore, the pressure-sensitive adhesive layer of JP '636 has a low modulus of elasticity at 100°C (M_{100}) and also has a low modulus of elasticity at 70°C (M_{70}), that is to say, both of M_{100} and M_{70} are low. Hence, M_{100}/M_{70} of JP '636 is not as small as that of the present invention. Furthermore, JP '636 and Komiyama et al. do not anticipate that the pressure-sensitive adhesive layers comprising the claimed composition (and thereby having a ratio (M_{100}/M_{70}) of 0.5 or less) is superior in embedding properties at die bonding.

The Examiner rejected the claims and stated, with regard to claim 1, that JP '636 is silent about the ratio of modulus over temperatures, but that since JP '636 teaches the same structure and composition for the same end use as the claimed invention, workable modulus ratio over temperatures are deemed to be an obvious routine optimization to one of ordinary skill in the art to obtain required properties for the same end use. This is far from a "routine optimization." Neither JP '636 nor Komiyama et al. address a composition that has superior embedding properties at die bonding. Moreover, as described above, JP '636 does not teach the claimed M_{100}/M_{20} ratio.

Applicant has cancelled claims 2-5 herein and incorporated the limitations thereof into claim 1. Thus, claim 1 as amended is deemed to be patentable over JP '636 and Komiyama et al.

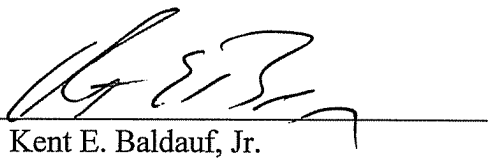
Double Patenting Rejection

Claims 1-6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims of co-pending Application Nos. 11/083,205; 11/596,427; 11/805,457; 11/945,769; 12/055,427; and 12/144,912. These are provisional rejections because the conflicting claims have not in fact been patented. Once issued as one or more patents, a terminal disclaimer will be considered.

In light of the amendments made herein, taken with the above remarks, claims 1, 6, and 8-12 are considered to be in condition for allowance. The Examiner's reconsideration and favorable action are respectfully requested.

Respectfully submitted,

THE WEBB LAW FIRM

By 

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